

MIL-N-25677C(ASG)

18 OCTOBER 1968

Superseding
MIL-N-25677B(ASG)
18 December 1964

MILITARY SPECIFICATION

NOZZLE, PRESSURE LUBRICATING OIL SERVICING, LOCKING

This specification has been approved by the Department of the Air Force and by the Naval Air Systems Command.

1. SCOPE

1.1 Scope.- This specification covers a nozzle installed in ground servicing equipment for providing lubricating and preservative oils, as specified herein, under pressure to the aircraft engine lubricating oil system, the nozzle being so designed as to attach securely to the aircraft installed lubricating oil pressure servicing adapter conforming to MIL-A-25676.

1.2 Classification.- Pressure lubricating oil servicing nozzles shall be of the sizes specified on MS24475 (see 6.2).

2. APPLICABLE DOCUMENTS

2.1 The following documents, of the issue in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein:

SPECIFICATIONS

Federal

QQ-P-416 Plating, Cadmium (Electrodeposited)

Military

MIL-H-775	Hose, Rubber or Fabric (Including Tubing), and Fittings, Nozzles and Strainers, Packaging of
MIL-D-1000	Drawings, Engineering and Associated Lists
MIL-S-7742	Screw Threads, Standard, Optimum Selected Series: General Specification for
MIL-L-7808	Lubricating Oil, Aircraft Turbine Engine, Synthetic Base
MIL-C-8188	Corrosion-Preventive Oil, Gas Turbine Engine, Aircraft, Synthetic Base
MIL-A-8625	Anodic Coatings, for Aluminum and Aluminum Alloys
MIL-L-23699	Lubricating Oil, Aircraft Turbine Engines, Synthetic Base
MIL-A-25676	Adapter, Pressure Lubricating Oil Servicing, Aircraft

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STANDARDSMilitary

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-129	Marking for Shipment and Storage
MIL-STD-130	Identification Marking of US Military Property
MIL-STD-143	Specifications and Standards, Order of Precedence for the Selection of
MIL-STD-831	Test Reports, Preparation of
MS24475	Nozzle, Pressure Lubricating Oil Servicing, Locking
MS24476	Adapter, Pressure, Lubricating Oil Servicing, Aircraft
MS29561	Packing, Preformed, "O" Ring, Synthetic Lubricant Resistant
MS33586	Metals, Definition of Dissimilar
MS33656	Fitting End, Standard Dimensions for Flared Tube Connection and Gasket Seal

(Copies of specifications, standards, drawings, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

3. REQUIREMENTS

3.1 Qualification.- The nozzle furnished under this specification shall be a product which has been tested and which has passed the qualification tests specified herein, and which has been listed on or approved for listing on the applicable Qualified Products List.

3.2 Components.- The complete nozzle assembly shall consist of a nozzle incorporating a self-sealing shutoff device. The nozzle shall be provided with a dust plug attached to the nozzle by a chain.

3.3 Selection of specifications and standards.- Specifications and standards for necessary commodities and services not specified herein shall be selected in accordance with MIL-STD-143, except as provided in 3.3.1 and 3.3.2.

3.3.1 Commercial parts.- Commercial parts having suitable properties may be used where, on the date of invitation for bids, there are no suitable standard parts. In any case, commercial utility parts such as screws, bolts, nuts, and cotter pins having suitable properties may be used, provided:

- (a) They can be replaced by the standard parts (MS or AN) without alteration.
- (b) The corresponding standard part numbers are referenced in the parts list and, if practical, on the contractor's drawings.

3.3.2 Standard parts.- Except as specified in 3.3.1, MS and AN standard parts shall be used where they suit the purpose. They shall be identified on the drawings by their part numbers.

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3.4 Materials.- Materials shall conform to applicable specifications and shall be as specified herein. Materials which are not covered by applicable specifications, or which are not specifically described herein, shall be of the lightest practicable weight and suitable for the purpose intended.

3.4.1 Metals.- All metals used in the construction of the nozzle that are not of a corrosion-resistant type, shall be suitably protected to resist corrosion in oil conforming to MIL-L-7808, salt spray, or atmospheric conditions in storage or during normal service life. The use of dissimilar metals, especially brass, copper, or steel, in contact with aluminum or aluminum alloy, shall be avoided where practicable. Dissimilar metals are defined by MS33586. Magnesium shall not be used.

3.5 Design.- The nozzle shall be designed to attach to a hose connected to the ground servicing equipment and to mate with an aircraft installed lubricating oil pressure servicing adapter conforming to MIL-A-25676. The nozzle, when disconnected from the adapter, shall automatically seal its severed end against spillage of fluid. The nozzle shall provide for displacement of the adapter poppet while engaged, as specified on MS24476. The nozzle shall provide for quick separation from the adapter.

3.5.1 Method of connecting and disconnecting.- Connecting and disconnecting the nozzle and the adapter shall be accomplished manually throughout the operating temperature range. After the nozzle and the adapter have been connected, positive flow of fluid shall be assured, and no possibility of fluid shutoff shall occur. A positive locking means shall be provided when the nozzle is connected to the adapter. The force required to engage the nozzle and the adapter shall not exceed 20 pounds.

3.5.2 Maintenance.- The nozzle shall have a minimum number of parts consistent with reliability. Its design shall, where practicable, permit easy assembly, disassembly, location of trouble sources, and maintenance with tools and equipment normally available commercially, by service maintenance personnel with a minimum of training.

3.6 Construction.- The nozzle shall be constructed to withstand the normal strains of jars, vibrations, and such other conditions incident to shipping, storage, installation, and service. All loose parts, such as gaskets and seals, shall be securely attached to the nozzle so that they will not become detached or damaged due to rough or inept handling during the process of connecting and disconnecting the nozzle to the adapter. Connecting and disconnecting the nozzle shall have no adverse effect on its leakage characteristics.

3.7 Performance.- The nozzle shall operate without failure under the conditions specified in 3.7.1 through 3.7.6. There shall be no leakage except for entrapped fluid within the nozzle which would be lost at disconnection.

3.7.1 Temperature range.- The nozzle shall function over a temperature range of -65° to $+160^{\circ}$ F.

3.7.2 Operation and leakage.- The nozzle self-sealing shutoff device shall be capable of sealing against a 2-foot head of MIL-L-7808 oil when not engaged. There shall be no visible signs of leakage during the operation and leakage tests specified in 4.6.2.

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3.7.3 Low temperature and leakage. - The nozzle shall not crack nor show other imperfections when subjected to an ambient temperature of -65° F for 24 hours. Following this cold soak, connection and disconnection of the nozzle and adapter shall be accomplished with relative ease and rapidity. There shall be no visible signs of leakage during the leakage tests specified in 4.6.4.

3.7.4 Pressure drop. - The pressure drop of the nozzle and adapter assembly, when tested as specified in 4.6.5, shall not exceed that specified on MS24475.

3.7.5 Poppet spring force. - The poppet spring tension (or compression) of the nozzle shall be such as to permit relatively easy coupling and uncoupling of the nozzle and to provide adequate sealing pressure on the poppet while uncoupled. The spring force shall be as specified in 4.6.6.

3.7.6 Side load. - The nozzle and adapter assembly shall not leak nor be distorted nor damaged in any way when subjected to the side load test as specified in 4.6.7.

3.8 Connections. - The nozzle fitting end shall conform to MS33656.

3.9 Screw threads. -

3.9.1 Straight screw threads. - All threads shall be in accordance with MIL-S-7742.

3.9.2 Antiseize compound. - An antiseize compound approved by the procuring activity shall be used on aluminum or aluminum alloy threaded parts.

3.10 Packing. - Oil seals shall conform to MS29561, where applicable. Where MS29561 seals are not applicable, the seals shall be suitable for use with oil conforming to MIL-L-7808, MIL-L-23699, and MIL-C-8188.

3.11 Interchangeability. - All parts having the same manufacturer's part number shall be functionally and dimensionally interchangeable. The drawing number requirements of MIL-D-1000 shall govern changes in the manufacturer's part numbers.

3.12 Dimensions. - The overall and mounting dimensions shall be as specified on MS24475.

3.13 Weight. - The weight shall be as specified on the manufacturer's drawings, as approved by the procuring activity.

3.14 Finish. -

3.14.1 Aluminum alloy parts. - Aluminum alloy parts shall be anodized in accordance with MIL-A-8625, of the class and type specified on the manufacturer's drawings.

3.14.2 Steel parts. - Steel parts shall be cadmium plated externally, where required, in accordance with QQ-P-416, class 2, type II.

3.15 Identification of product. - Equipment assemblies and parts shall be marked for identification in accordance with MIL-STD-130.

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3.16 Workmanship.- The nozzle assembly shall be constructed and finished in a workmanlike manner. Fittings shall be free from burrs and longitudinal and spiral tool marks. All sealing surfaces shall be smooth, except that annular tool marks up to 100 microinches roughness height rating will be acceptable.

3.16.1 Tolerances.- All pertinent dimensions and tolerances, where interchangeability, operation, or performance of the nozzle may be affected, shall be specified on the manufacturer's drawings (see 4.3.1.1).

3.16.2 Cleaning.- The nozzle shall be thoroughly cleaned of dirt, sand, metal chips, or other foreign materials while being assembled and after final assembly.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection.- Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.2 Classification of inspection.- The examination and testing of the nozzles shall be classified as follows:

- (a) Qualification inspection (4.3)
- (b) Quality conformance inspection (4.4)

4.3 Qualification inspection.-

4.3.1 Qualification inspection samples.- The qualification inspection samples shall consist of two complete nozzles. One of the nozzles shall have been examined and tested by the contractor in accordance with this specification. The remaining nozzle shall be an untested unit. Samples for each size nozzle shall be accompanied by four complete sets of legible detail and assembly drawings, and complete test reports showing results of manufacturer's tests. Samples shall be identified with the manufacturer's own part number and any additional information required by the letter of authorization (see 6.3).

4.3.1.1 Manufacturer's drawings.- Manufacturer's drawings submitted with the test samples shall include a sectional view showing all parts in their normal assembly position and shall specify part numbers of all parts and subassemblies. The following data shall be furnished on or together with the assembly drawing:

- (a) Detailed internal construction.
- (b) Internal, external, and overall dimensions.
- (c) Materials of construction, treatment, and finish.
- (d) Weight.

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4.3.1.2 Manufacturer's test report. - The test report submitted with the test sample shall conform to MIL-STD-831 and shall include the following:

- (a) Report of all tests, graphically presented when possible, together with a detailed statement indicating compliance or extent of noncompliance with all requirements of this specification, referring specifically to paragraph numbers.
- (b) Outline and description of tests and test conditions.
- (c) Copies of test log sheets.

4.3.2 Qualification required. - Prior to actual procurement, the product covered by this specification shall pass the qualification inspection specified herein. If the product is later modified in any way, the modified product shall be subjected to and shall pass the same qualification inspection.

4.3.3 Qualification. - Qualification shall consist of the examination and tests as described under 4.6 and shall be performed on nozzles in the following order:

- (a) Examination of product (4.6.1)
- (b) Operation and leakage (4.6.2.2)
- (c) Low temperature and leakage (4.6.4)
- (d) Pressure drop test (4.6.5)
- (e) Accelerated corrosion test (4.6.8)
- (f) Side load test (4.6.7)
- (g) Poppet spring tension test (4.6.6)
- (h) Hydrostatic back pressure (4.6.3)
- (i) Disassembly and inspection (4.6.9)

4.4 Quality conformance inspection. - Quality conformance inspection shall consist of:

- (a) Individual test (4.4.1)
- (b) Sampling tests (4.4.2)

4.4.1 Individual test. - Each nozzle shall be subjected to the examination of product specified in 4.6.1.

4.4.2 Sampling tests. -

4.4.2.1 Lot. - A lot shall consist of all nozzles of the same part number which have been manufactured under essentially the same conditions and at substantially the same time.

4.4.2.2 Sampling instructions. - Sample nozzles from each lot, of an order that has passed the individual test, shall be selected in accordance with MIL-STD-105 and subjected to the sampling test (4.6.2.1). General inspection level II and an AQL of 2.5 shall be used to determine sample size and lot acceptance/rejection criteria.

4.5 Test conditions. -

4.5.1 Cleaning. - Before testing, all oil and grease or other corrosion-resistant compound shall be removed from the interior and exterior parts of the nozzle.

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4.5.2 Temperatures.- Unless otherwise specified, all testing shall be conducted at room temperature, $70^{\circ} \pm 10^{\circ}$ F.

4.5.3 Test adapter.- When reference is made in this specification to an adapter used in conjunction with testing of the nozzle, the adapter shall conform to MIL-A-25676.

4.6 Inspection methods.-

4.6.1 Examination of product.- Each nozzle shall be visually examined for defects of material, workmanship, finish, and for conformance to MS24475 and all requirements of this specification for which no tests are specified.

4.6.2 Operation and leakage.-

4.6.2.1 Sampling test.- The nozzle shall be connected and disconnected from the test adapter 10 times while dry. Connections and disconnections shall be accomplished with relative ease and rapidity and without the use of tools. There shall be no binding, sticking, or scoring of parts. The nozzle shall then be connected to a test adapter and hydrostatically tested, using MIL-L-7808 oil at a pressure of 500 psi for 1 minute. There shall be no visible signs of leakage from the nozzle portion.

4.6.2.2 Qualification test.- This test shall be the same as 4.6.2.1, except that the nozzle and adapter shall be connected and disconnected 2,000 times.

4.6.3 Hydrostatic back pressure.- A hydrostatic back pressure of a 2-foot head of MIL-L-7808 oil shall be applied to the nozzle for 1/2 hour. There shall be no visible signs of leakage.

4.6.4 Low temperature and leakage test.- A nozzle and adapter, while disconnected, shall be filled with oil conforming to MIL-L-7808 and cold soaked at a temperature of -65° F for 24 hours. The following tests shall then be conducted at an ambient temperature of -65° F:

- (a) The nozzle and adapter shall be connected and disconnected. This shall be accomplished with relative ease and rapidity. There shall be no binding, locking, or scoring of parts.
- (b) The nozzle and adapter shall then be connected and a hydrostatic pressure of 500 psi of MIL-L-7808 oil shall be applied at the nozzle inlet for 1 minute. There shall be no visible signs of leakage from the nozzle.
- (c) The nozzle only shall be subjected to the test in 4.6.3.

4.6.5 Pressure drop test.- With the nozzle connected to an adapter, the assembly shall be filled with oil and cold soaked at -65° F ambient air temperature for 24 hours. While maintained at this temperature, the following procedure shall be conducted:

- (a) Oil conforming to MIL-L-7808 at -65° F shall be flowed through the assembly at the rate of 1 gallon per minute. The maximum pressure drop across the assembly required to establish rated flow shall be determined.

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- (b) The pressure drop shall then be determined with the oil entering the assembly at -45° F and at a flow rate of 1 gpm. The pressure drop with -45° F oil shall not exceed that shown on MS24475.

Pressure measurements shall then be taken at least 10 diameters upstream and 10 diameters downstream from the assembly. Temperature measurements shall be taken 10 diameters upstream of the assembly.

4.6.6 Poppet spring test.- The force required to open the nozzle poppet valve 0.25 inch shall be determined. This force shall not exceed 15 pounds.

4.6.7 Side load test.- An adapter in accordance with MIL-A-25676 shall be mounted to a test fixture simulating a typical installation. The nozzle shall be connected to the adapter and a 2-pound weight simulating the weight of the hose shall be applied to the hose end of the assembly perpendicular to the center axis for a period of 10 minutes. During this time oil shall be flowed through the assembly at the rate of 2 gpm with a back pressure of 25 psi. At the completion of this test, the tests described in 4.6.2 and 4.6.3 shall be repeated.

4.6.8 Accelerated corrosion test.- The nozzle shall be immersed in a solution consisting of 2.5 percent, by weight, of sodium chloride in distilled water. After immersion, the solution shall be drained and the nozzle heated in an oven to a temperature of $130^{\circ} +5^{\circ}$ F for a period of not less than 1 hour. The immersion and heating cycle shall be repeated 50 times. The nozzle shall not be operated at any time during these cycles. Immediately after completing the immersion and heating cycles, the nozzle shall be thoroughly washed with warm water to remove all salt accumulations. The nozzle shall then be dried, wetted with oil, and connected and disconnected for three complete cycles. There shall be no corrosion of any part to a degree which might adversely affect the performance of the nozzle.

4.6.9 Disassembly and inspection.- After completion of the tests, the nozzle shall be disassembled and inspected. If corrosion, deterioration, or undue wear exists to a degree which could adversely affect performance, the adapter shall be rejected.

4.7 Preservation, packaging, packing, and marking.- Preparation for delivery shall be examined for conformance to section 5.

5. PREPARATION FOR DELIVERY

5.1 Preservation, packaging, and packing.- The nozzle shall be preserved, packaged, and packed in accordance with MIL-H-775.

5.2 The levels of preservation and packaging shall be level A or C, and the level of packing shall be level A, B, or C, as specified (see 6.2).

5.3 Marking.- The shipment marking nomenclature shall be: "Nozzle, Pressure Lubricating Oil Servicing, Locking". In addition to any special marking required, unit packages, intermediate packages, and shipping containers shall be marked in accordance with the requirements of MIL-STD-129.

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6. NOTES

6.1 Intended use.- The nozzles covered by this specification are intended for use in servicing turbine engine lubricating oil systems, using a pressure lubricating oil servicing adapter conforming to MIL-A-25676 and synthetic oils conforming to MIL-L-7808, MIL-C-8182, or MIL-L-23699.

6.2 Ordering data.- Procurement documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Size of nozzle required (see 1.2).
- (c) Level of preservation, packaging, and packing required (see 5.2).

6.3 Qualification.- With respect to products requiring qualification, awards will be made only for such products as have, prior to the time set for opening of bids, been tested and approved for inclusion in the applicable Qualified Products List, whether or not such products have actually been so listed by that date. The attention of suppliers is called to this requirement, and manufacturers are urged to arrange to have the products that they propose to offer the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. The activity responsible for the Qualified Products List is the Systems Engineering Group (SEG), Attn: SEJIF, Wright-Patterson Air Force Base, Ohio 45433, and information pertaining to qualification of products may be obtained from that activity.

6.4 International standardization.- Certain provisions of this specification are the subject of international standardization agreement ASQC AIR STANDARD 11/12. When amendment, revision, or cancellation of this specification is proposed, the departmental custodians will inform their respective Departmental Standardization Offices so that appropriate action may be taken respecting the international agreement concerned.

6.5 Marginal indicia.- The margins of this specification are marked to indicate where changes, deletions, or additions to the previous issue have been made. This is done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Deletions are not indicated. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content as written, irrespective of the marginal notations and relationship to the last previous issue.

Custodians:
Navy - AS
Air Force - 11

Preparing activity:
Air Force - 11

Reviewer activities:
Navy - AC
Air Force - 11, 82

Project No. 4930-F020

International interest (see 6.4)

SPECIFICATION ANALYSIS SHEET

Form Approved Budget
Bureau No. 119-R004INSTRUCTIONS

This sheet is to be filled out by personnel either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity.

SPECIFICATION

MIL-N-25677C(ASG) Nozzle, Pressure Lubricating Oil Servicing, Locking

ORGANIZATION

CITY AND STATE

CONTRACT NO.

QUANTITY OF ITEMS PROCURED

DOLLAR AMOUNT

\$

MATERIAL PROCURED UNDER A

 Direct Government Contract Subcontract

1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?

A. GIVE PARAGRAPH NUMBER AND WORDING.

B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES.

2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID.

3. IS THE SPECIFICATION RESTRICTIVE?

 YES NO

IF "YES", IN WHAT WAY?

4. REMARKS (Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity.)

SUBMITTED BY (Printed or typed name and activity)

DATE

FOLD

POSTAGE AND FEES PAID
DEFENSE SUPPLY AGENCY

~~OFFICIAL BUSINESS~~

Aeronautical Standards Group (ASG)
8719 Colesville Rd.
Silver Spring, Md. 20910

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